

rethinking Dairyland

Background for Decisions about Wisconsin's Dairy Industry



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GOT JOBS?

After accounting for the multiplier effect, the Wisconsin dairy industry accounted for roughly 5.1 percent of all employment in Wisconsin, 3.6 percent of Wisconsin's gross state product, and 5.9 percent of total Wisconsin industrial sales.

Dairy's contribution to the Wisconsin economy takes many forms. Most obvious is the direct or initial contribution through on-farm and processing employment and income generation. For 1999, the most current year for which complete income and employment data are available, dairy production, both on-farm and dairy processing, accounted for 80,500 jobs or about 2.6 percent of all employment in Wisconsin and \$1.9 billion worth of income. Total industrial sales from dairy farms and dairy processors combined amounted to \$11.7 billion, accounting for 1.3 percent of Wisconsin's total industrial sales.

How dairying's impact multiplies

But that's only part of the picture. Other industries are linked, through indirect and induced effects, to the dairy industry. These industries represent additional sources of economic activity, in essence multiplying the effects of the direct activity of dairy production and processing. The dairy industry impacts many parts of the larger Wisconsin economy through this multiplier effect.

The dairy industry uses machinery, trucks, fuel, financial and other businesses services and a range of inputs from other industries. These linkages, or indirect effects, create a network of interdependent industries, which in turn generate additional jobs and income in non-dairy industries. The income generated directly by dairy farms and processors also adds to this interdependency; on-farm and dairy processing

employees spend their wages and salaries on groceries, housing, entertainment, and a range of other consumer goods and services. In turn employees in these industries spend their income on consumer goods and services. These additional linkages, beyond dairy and indirectly related sectors of the economy, create induced effects, which help to form a complex intertwining of industries within Wisconsin. So the relevant question to ask is not what dairy adds to the Wisconsin economy directly through income and employment generation, but rather how much does agriculture contribute to the Wisconsin economy through this complex networking of industries.

Tracking the links between industries.

There are many ways to analyze regional economies and measure the linkages between sectors. To measure the impact of Wisconsin dairying, we used a social accounting matrix — basically a “snapshot” of the economy that looks at the sales and purchases of goods and services between all sectors of the economy for a given period of time.

By looking at dairy firms' spending and sales, we can assess the contribution of the dairy industry to Wisconsin's economy. By tracing the flow of dairy-related dollars throughout the economy we can capture and measure the “multiplier effect.”

We used a software package, IMPLAN (Impact PLANning), to create the social accounting matrix for

This is part of a series of brief reports on the current state of the Wisconsin dairy industry and factors that will influence its evolution. All reports in the series, along with expanded versions containing additional data and graphics, can be accessed at the following web address: <http://www.aae.wisc.edu/www/pub/>

If you do not have internet access, copies can be obtained from Ms. Linda Davis, Department of Agricultural and Applied Economics, University of Wisconsin-Madison, 427 Lorch St., Madison, WI 53706. Telephone (608) 262-9488 or email davis@aae.wisc.edu

Wisconsin. All analyses reported here are for calendar year 1999, the most recent year for which the data are available. The model has detail for 486 business sectors and 17 institutional sectors (i.e., household groups, governments, etc.).

What the analysis shows

For this analysis we looked at three levels of economic activity: on-farm dairy production; off-farm dairy processing; and on- and off-farm dairy operations combined. The results of these analyses are presented in Tables 1-3.

Accounting for the multiplier affect, here's what the Wisconsin dairy industry contributes to the state's economy:

- About 174,000 jobs, representing about 5.1 percent of all employment in Wisconsin
- About \$5.7 billion income going to households (about 3.6 percent of Wisconsin's gross state product)
- About \$18.5 billion in industrial sales (about 5.9 percent of total Wisconsin industrial sales)

Separately, on-farm dairy production accounted for 90,700 jobs, \$1.5 billion in household income and \$4.9 billion in industrial sales. The Wisconsin dairy processing sector accounted for 99,700 jobs, \$4.8 billion in household income (gross state product) and about \$17 billion in industrial sales.

Avoiding double-counting jobs

It is important to note that the sum of the two individual components of the combined dairy sector, on-farm production and off-farm processing, do not add to the combined effects. In other words, directly adding the summaries of Tables 1 and 2 will not result in Table 3. The whole is not equal to the sum of the parts because of "spillover" effects between the two components. Clearly on-farm production influences off-farm processing and the demand for raw milk by processors influences on-farm production. In that sense, on-farm production and off-farm processing are mutually interdependent. The analysis summarized in Table 1 captures the dependency going in one direction while the analysis in Table 2 captures the dependency going in the other direction. Adding Table 1 to Table 2 would double count those co-dependencies and thereby result in a double counting error.

If dairy ceased to exist

This analysis doesn't suggest that if dairying ceased to exist total employment in Wisconsin would decline by 5.1 percent or gross state product (household income) would decline by \$5.7 billion. For that to happen, all employees connected to dairying would have to pack up their families and leave Wisconsin, and all of the inputs used for dairying — either directly, such as land, or indirectly through the multiplier effect — would have to be left idle. That's not going to happen.

A more reasonable interpretation is that the dairy industry is "connected" to these dollars and jobs either directly or through the multiplier effect.

Nearly every sector is tied to dairy

Looking at the contribution of the dairy industry to Wisconsin across different sectors of the economy shows that the Wisconsin economy is extremely intertwined and interdependent; nearly every sector in Wisconsin is linked to dairy. For example, the dairy industry affects the construction industry to the tune of almost 3,600 jobs annually. Retail and wholesale trade takes in nearly \$1.2 billion in household income from dairy. In terms of industrial sales, 36.5 percent of the total impact of dairy comes from sectors other than dairying itself. In terms of income, 66.8 percent of the total \$5.7 billion impact comes from non-dairy sectors. The "rippling," or multiplier effect that dairying has on Wisconsin's economy is significant. Most of it comes from dairy processing.

The tax impact

The economic activity generated by dairy adds significantly to tax revenues at both the federal and state and local levels (Table 4). On-farm dairying creates almost \$241 million in federal tax revenues while all of dairying generates in excess of \$1 billion in federal taxes. On-farm dairy operations generate about \$158 million in state and local taxes (not including support for K-12 public education) while all of dairying generates \$688 million in state and local tax revenues. These tax revenue figures include taxes paid directly by dairy operators and employees and taxes from all the economic activity generated by the dairy industry.

This factsheet is based on Market and Policy Briefing Paper No. 78A. To obtain a copy, see page 1 of this factsheet.

This report was written by Steven C. Deller, Professor and Extension Community Development Specialist, University of Wisconsin-Madison and University of Wisconsin-Extension. Contact him at (608) 263-6251, deller@aae.wisc.edu.

TABLE 1: Economic Impact, On Farm Dairy, 1999 Wisconsin

<i>Sector</i>	<i>Jobs</i>	<i>Total Income (\$1,000)</i>	<i>Industrial Output (Sales/\$1,000)</i>
Dairy Farm Products	63,742	542,322	3,146,199
Agriculture	11,721	119,926	383,807
Mining	4	503	752
Construction	1,136	50,064	87,557
Manufacturing	665	44,946	143,880
TCPU*	1,864	149,792	273,886
Trade	5,170	256,209	357,539
FIRE**	1,919	185,603	267,539
Services	4,331	142,517	230,702
Government	197	12,154	28,670
Total	90,748	1,504,037	4,920,532
Implicit Multiplier	1.424	2.773	1.564
Wisconsin State Total	3,393,514	161,484,190	311,245,490
Percent of State Total	2.7%	0.9%	1.6%
Initial	63,742	542,322	3,146,199
Indirect	19,795	645,892	1,264,629
Induced	7,211	315,823	509,703
Total	90,748	1,504,037	4,920,531

* TCPU: Transportation, Communications, and Public Utilities

**FIRE: Finance, Insurance, and Real Estate

TABLE 2: Economic Impact, Off Farm Dairy Processing, 1999 Wisconsin

<i>Sector</i>	<i>Jobs</i>	<i>Total Income (\$1,000)</i>	<i>Industrial Output (Sales/\$1,000)</i>
Agriculture	29,610	677,352	3,843,834
Mining	11	1,683	2,507
Construction	2,486	109,314	193,401
Manufacturing	3,481	210,597	631,294
Dairy Processing	16,762	1,366,408	8,571,647
TCPU*	4,321	344,252	637,563
Trade	18,863	931,785	1,305,853
FIRE**	5,123	509,343	742,858
Services	18,397	592,585	948,925
Government	630	36,736	85,101
Total	99,685	4,780,056	16,962,985
Implicit Multiplier	5.947	3.498	1.979
Wisconsin State Total	3,393,514	161,484,190	311,245,490
Percent of State Total	2.9%	3.0%	5.5%
Initial	16,762	1,366,408	8,571,647
Indirect	60,456	2,431,086	6,811,614
Induced	22,467	982,562	1,579,724
Total	99,685	4,780,056	16,962,985

* TCPU: Transportation, Communications, and Public Utilities

**FIRE: Finance, Insurance, and Real Estate

TABLE 3: Economic Impact, Dairy Combined, 1999 Wisconsin

<i>Sector</i>	<i>Jobs</i>	<i>Total Income (\$1,000)</i>	<i>Industrial Output (Sales/\$1,000)</i>
Agriculture	88,422	797,278	3,959,781
Mining	15	2,186	3,260
Construction	3,622	159,378	280,958
Manufacturing	20,895	1,620,909	9,340,973
TCPU*	6,186	494,045	911,450
Trade	24,033	1,187,993	1,663,392
FIRE**	7,042	694,947	1,010,397
Services	22,728	735,102	1,179,628
Government	828	48,890	113,771
Total	173,770	5,740,729	18,463,609
Implicit Multiplier	2.159	3.008	1.576
Wisconsin State Total	3,393,514	161,484,190	311,245,490
Percent of State Total	5.1%	3.6%	5.9%
Initial	80,504	1,908,730	11,717,847
Indirect	63,599	2,534,594	4,668,158
Induced	29,666	1,297,405	2,077,604
Total	173,770	5,740,729	18,463,609

* TCPU: Transportation, Communications, and Public Utilities

**FIRE: Finance, Insurance, and Real Estate

TABLE 4: Federal, State and Local Tax Contribution of Wisconsin Dairying, 1999

<i>Type of Tax</i>	<i>On-Farm</i>	<i>Processing</i>	<i>Total</i>
		\$	
<i>Federal Taxes:</i>			
Business Income Taxes	\$28,480,574	\$121,914,651	\$150,395,225
Indirect Business Taxes	13,446,168	45,676,151	59,122,319
Payroll Taxes- Employee Contribution	54,996,037	174,329,838	229,325,875
Payroll Taxes - Employer Contribution	45,178,406	161,705,032	206,883,438
Personal Tax: Income Tax	98,122,526	301,942,421	400,064,947
Other Personal Taxes and Fees	1,143,088	3,517,508	4,660,596
Total Federal	\$241,366,798	\$809,085,602	\$1,050,452,400
<i>State/Local Taxes:</i>			
Business Income Taxes	\$5,694,808	\$24,377,335	\$30,072,142
Indirect Business Taxes	106,991,186	363,537,117	470,528,303
Payroll Taxes- Employee Contribution	250,560	896,817	1,147,377
Payroll Taxes - Employer Contribution	1,015,427	3,634,471	4,649,898
Motor Vehicle License Fees	1,226,473	3,787,951	5,014,424
Personal Property Taxes	714,511	2,229,264	2,943,774
Personal Income Taxes	33,815,383	104,438,485	138,253,868
Other Personal Taxes	8,600,599	26,804,536	35,405,134
Total State and Local	158,308,946	529,705,974	688,014,920
Grand Total	\$399,675,744	\$1,338,791,576	\$1,738,467,320